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DISPOSABLE CONTAINER WITH A SPILL PREVENTION MECHANISM

Background of the Invention

Individuals who are unable to use conventional water-flushing toilets due to urge incontinence, lack of mobility, or physical size frequently use bedpans, commodes, or toilet training chairs. In addition, campers, backpackers, or individuals without access to conventional running water supplies frequently use portable toileting devices. There are numerous toileting devices manufactured for use in such applications, however, cleaning the waste receptacle of such devices is a laborious and undesirable task, and exposes the individual to health risks. Additionally, transporting the bedpan or waste receptacle to a water-flushing toilet or other suitable disposal facility in order to dump the bodily wastes creates a potential for sloshing, splashing, or spilling of bodily wastes during transport and disposal. Such contamination on floors, bedding, or individuals creates health risks and is of a special concern to nurses or any caregiver that must perform this task numerous times.

In addition to preventing spills of bodily wastes or other materials within the container during transport, there is also a need for a convenient way to dispose of the container and material within the container. Disposal of used commode liners into a garbage can or other suitable disposal facility creates the risk of spreading infectious diseases, leads to undesirable odors, and increases the chances for spilling the commode liner's bodily-wastes during further handling.

Therefore, there is a need for a container that is conveniently disposable by a water-flushing toilet without the need to be emptied. There is also a need for a container that prevents or minimizes the potential for spilling bodily wastes or other materials while transporting the container for disposal.

Summary of the Invention

It has been discovered that by designing a container having a separate receiving portion and a separate collection portion, the splashing and possible spilling of materials is minimized by the use of an anti-splash member located between the receiving portion and the collection portion of the container. Accordingly, the container may be used as a disposable liner for use with a bedpan, toilet training chair, commode, or other structure suitable for toileting where it is desirable to line the interior with a disposable container. However, the container is also useful to collect and dispose of other materials in which prevention of accidental spills and convenient disposal is desired. Thus, the container's application is not limited solely to use as a commode liner, vomit bag, or sample bag.

Hence, in one aspect the invention resides in a container including a first opposing member and a second opposing member joined together defining a top, a bottom, and a pair of opposing sides, with the top having an opening formed therein for receiving materials. An anti-splash member divides the container into a receiving portion and a collection portion, and the anti-splash member has at least one seam formed by joining the first and second opposing members together defining at least one aperture. The anti-splash member promotes passage of materials through the aperture from the receiving portion into the collection portion, and passage of materials from the collection portion to the receiving portion is restricted by the anti-splash member.

In another aspect, the invention resides in a container including a top and a bottom connected by at least one sidewall, the top having an opening formed therein for receiving materials. An anti-splash member divides the container into a receiving portion and a collection portion, the anti-splash member having at least one restrictor flap defining a passageway between the restrictor flap and the sidewall into the receiving portion. The anti-splash member promotes passage of materials through the passageway from the receiving portion to the collection portion, and passage of materials from the collection portion to the receiving portion is restricted by the anti-splash member.

In yet another aspect, the invention resides in a container including a top and a bottom connected by at least one sidewall, the top having an opening formed therein for receiving materials. Anti-splash means for reducing spilling divides the container into a receiving portion and a collection portion, the anti-splash means promoting passage of materials from the receiving portion into the collection portion while restricting passage of materials in a reverse direction. The container is formed from a material that is water degradable.

Brief Description of the Drawings

The foregoing aspects and other features, aspects, and advantages of the present invention will be further described with regard to the following detailed description:

Figure 1 illustrates a perspective view of one embodiment of a disposable container in accordance with this invention.

Figure 2 is a cross-section taken along line 2-2 of Figure 1 illustrating a suitable layered structure for a water degradable material useful for a flushable container.

Figure 3 is a schematic vertical cross-section illustrating another embodiment of the anti-splash member of Figure 1.

Figure 4 is a schematic vertical cross-section illustrating another embodiment of the anti-splash member of Figure 1.

Figure 5 is a schematic vertical cross-section illustrating another embodiment of the anti-splash member of Figure 1.

Figure 6 is a schematic vertical cross-section illustrating another embodiment of the anti-splash member of Figure 1.

Figure 7 illustrates a perspective view of another embodiment of a disposable container in accordance with this invention.

Figure 8 illustrates a perspective view of another embodiment of a disposable container in accordance with this invention.

Figure 9 is a schematic of a process to manufacture a disposable container in accordance with this invention.

Figure 10 illustrates a manufactured web of disposable containers prior to packaging.

Detailed Description of the Invention

I. Definitions

As used herein, "barrier layer" means a layer comprising a non-water-soluble polymer. Suitable examples of barrier layers include poly(lactic acid) (PLA), polyesteramides, poly(glycolic acid), poly(hydroxy butyrate-co-valorate), polyalphaoefin, and polyvinylidene chloride. More desirable barrier layers are biodegradable, however biodegradability is not an essential characteristic.

As used herein, "bodily wastes" includes all body exudates, including but not limited to, urine, feces, menses, vomit, spit, tears, nasal discharge, and perspiration.

As used herein, "commode liner" means a liner for a bedpan, toilet training chair, potty chair, portable toilet, commode, toilet, bucket, pail, or any other suitable structure for toileting use by an individual.

As used herein, "disposable container" refers to a container which is intended to be discarded after a single use, and the original container in its whole is not intended to be laundered, washed, or otherwise restored or reused as a container.

As used herein, "flushable" means a product suitable for disposal in sewer systems or septic systems that can be flushed down an ordinary water-flushing toilet. A non-dispersible wet wipe intended for use instead of or in conjunction with bathroom tissue is one common example of a product that is flushable but does not readily degrade in water. A subset of flushable materials are "water degradable" materials that disintegrate, disperse, dissolve or otherwise break apart after being placed in water. One common example of water degradable materials are laminates formed from a non-water-soluble polymer joined to a water-soluble polymer such as a layer of polyvinylidene chloride joined to a layer of polyvinyl alcohol.

As used herein "joined" includes configurations where one element is directly or indirectly attached to another element by any means including, but not limited to, adhesives, thermal bonding, sonic bonding, chemical bonding, mechanical bonding, pressure bonding, heat and pressure bonding, hydrogen bonding, fasteners, stitching, or other means known to those skilled in the art. By "indirectly joined" it is meant one element is attached to a second element by one or more intermediate members. For instance, the outer layers in an ordinary plywood laminate are indirectly joined to each other by the laminate's intermediate layers.

As used herein "laminate" refers to a structure comprising two or more layers joined together. A laminate may be constructed by joining layers of the same material together: One common example is an ordinary plywood laminate. A laminate may also be constructed by joining layers of different materials together: One common example is the wax-coated cardboard laminate used for milk cartons.

As used herein, "saturation layer" means a layer that allows for water to saturate the layer or pass through the layer. More desirable saturation layers include hydrophilic fibers that wick or absorb water, such as wood pulp fibers, cotton fibers, cellulosic fibers, or surfactant treated polymeric microfibers. However, it is possible to construct a saturation layer from hydrophobic materials if they are arranged in a layer with sufficient porosity to enable water to penetrate and disperse the water-sensitive layer (as defined next). It is also possible to construct a saturation layer using a water-triggered binder that holds the layer together.

As used herein, "water-sensitive layer" means a material that loses integrity over time when in the presence of water. Non-limiting examples include water-soluble or water-dispersible films and water-soluble or water dispersible microfibers. The water-

sensitive layer may be made entirely of a water-sensitive polymeric material or may contain water-sensitive as well as water-insoluble materials so long as the water-sensitive layer dissolves, disperses, or breaks apart in water, such as when disposed in a conventional water-flushing toilet. Non-limiting examples of water-sensitive layers include polyvinyl alcohol (PVOH), polyalkylene oxides, such as polyethylene oxide and ethylene oxide/propylene oxide copolymers, polymethacrylic acid, polymethacrylic copolymers, poly(2-ethyl oxazoline), polyvinyl methyl ether, polyvinyl pyrrolidone/vinyl acetate copolymers, methyl cellulose, ethyl cellulose, hydroxypropyl cellulose, hydroxypropyl methyl cellulose, ethyl hydroxyethyl cellulose, methyl ether starch, poly (n-isopropyl acrylamide), poly N-vinyl caprolactam, polyvinyl methyl oxazolidone, poly (2-isopropyl-2-oxazoline), and poly (2,4-dimethyl-6-triazinylethylene).

II. Detailed Description of the Drawings

Referring now to Figure 1, shown is one embodiment of the invention in which a container 20 is adapted for use as a commode liner to contain bodily wastes, although the container 20 may be used to contain other materials or liquids. Desirably, the container 20 is disposable and is intended for a single use prior to discarding. The container 20 can be any shape or size depending on the specific application. When the container 20 is used as a commode liner, the shape of the toileting structure's waste collection receptacle will determine the size of the container. The container 20 has a receiving portion 22 and a collection portion 24. The function of the receiving portion 22 is to take in materials and direct them towards the collection portion 24. The function of the collection portion 24 is to contain the material. Disposed between the receiving portion 22 and the collection portion 24 is an anti-splash member 26. The function of the anti-splash member 26 is to minimize splashing and potential spilling of materials within the collection portion 24 during use or while transporting the container 20 to an appropriate disposal means. The anti-splash member 26 may be constructed in several different ways, which will be discussed in more detail later.

The container 20 may be constructed of any suitable material, including but not limited to, plastics, films, paper, tissue, biodegradable materials, nonwovens, or laminates as are known, or become known, to those skilled in the art. Desirably, the container 20 is constructed from a flushable material that is strong and flexible, since one object in the design of containers for use as a commode liner is the ability to flush the container 20 and any bodily wastes down an ordinary water-flushing toilet. In this regard, the container 20 must have sufficient strength when in contact with bodily wastes, yet the container 20 must be flushable.

Furthermore, it is desirable for the container 20 to be constructed of one or more water degradable materials. In addition, the material that forms the container 20 desirably has sufficient strength such that the container 20 and any bodily wastes contained therein may be removed from the waste receptacle or other toileting structure, and then transported or placed into a water-flushing toilet or other disposal means. However, the container 20 can be constructed from one or more thinner materials having insufficient strength to remove the container 20 from the waste receptacle after use. Using a stronger material that allows for removal of the container 20 from the waste receptacle and minimizes the possibility of contamination that occurs when dumping the waste receptacle's contents into the water-flushing toilet. In addition, reduced contamination of the bathroom and caregiver occurs since the container 20 and waste contents may be gently placed into a water-flushing toilet, instead of being dumped into the toilet from an elevated height above the surface of the water. Finally, no cleaning of the waste receptacle is required because the container 20 prevents bodily wastes from contacting the waste receptacle.

Referring now to Figure 2, shown is a laminate 28 having desirable properties for flushability of the container 20. The laminate 28 can include a barrier layer 30, a water-sensitive layer 32, and a saturation layer 34, although it is possible to include only the barrier layer 30 and the water-sensitive layer 32. The thickness of the layers as shown in Figure 2 are not drawn to scale, since the choice of material used for each layer will determine the necessary amount and thickness of material required. In one embodiment, the laminate 28 included a barrier layer 30 formed from a PLA compound, a water-sensitive layer 32 formed from a PVOH compound, and a saturation layer 34 formed from cellulosic fibers such as an ordinary tissue web. The three layers of the laminate 28 are joined together. When constructing the container 20 from the laminate 28 shown in Figure 2, the barrier layer 30 is situated on the inside of the container 20 while the saturation layer 34 forms the outside of the container 20.

The laminate 28 shown in Figure 2 provides strength in use and is water degradable. The inside barrier layer 30 is impervious to liquids, and forms a barrier to prevent bodily wastes from contacting the middle water-sensitive layer 32. The middle water-sensitive layer 32 will readily break apart, dissolve, or disperse when contacted by water. The outside saturation layer 34 promotes hydration of the middle water-sensitive layer 32. After the container 20 has been used, it is removed from the toileting structure, and then placed into a water-flushing toilet. Upon contact with the water, the outside saturation layer 34 wicks, saturates, or otherwise transports water to the middle water-sensitive layer 32, which then begins to break apart, disperse, or dissolve. Once the

middle water-sensitive layer 32 degrades, insufficient joining is present to hold the laminate 28 together. Degradation of the middle water-sensitive layer 32 either disperses or delaminates the other two layers of the laminate 28. The laminate 28 is flushable by the forces provided during flushing of an ordinary water-flushing toilet, and the laminate 28 can be flushed before or after the laminate 28 has broke apart or dispersed from contact with the water in the toilet.

Another example of a suitable container material that is water degradable is disclosed in U.S. 5,508,101 issued April 16, 1996, to Patnode and entitled "Dispersible Compositions And Articles And Method Of Disposal For Such Compositions And Articles" which is made a part hereof and is incorporated by reference. Patnode discloses examples of a hydrolytically degradable polymer in combination with a water-soluble polymer to form a material that will break apart with in water having an elevated temperature, or an elevated pH level. The hydrolytically degradable polymers can include poly(lactic acid), polyesteramides, poly(glycolic acid), and poly(hydroxy butyrate-co-valorate). Suitable water-soluble polymers can include poly(vinyl alcohol), poly(aspartic acid), poly(acrylic acid), poly(methacrylic acid), poly(acrylamide), poly(vinyl pyrrolidone), and poly(alkyleneoxide)s. The constructed materials can include single layer films, multiple layer films, non-woven webs formed from staple fibers, non-woven webs formed from single layer microfibers, non-woven webs formed from multiple layer microfibers, and non-woven webs formed from microfibers of blended compositions.

Another example of a suitable container material that is water degradable is disclosed in U.S. 5,674,578 issued October 7, 1997, to Giori entitled "Water Soluble/Dispersible Multilayered File Of High Interlayer Adhesive Strength And Collection Pouches Formed Therefrom" which is made a part hereof and is incorporated by reference. Giori discloses a multilayered film having a high interlayer adhesive strength including a water-sensitive load bearing layer having a thickness within the range of 1 to 5 mils and consisting essentially of a blend of polyethylene oxide and plasticized polyvinyl chloride laminated and bonded to a barrier layer having a thickness within the range of 0.05 to 1.0 mils. The barrier layer includes at least one water insoluble polymer or copolymer of vinylidene chloride. If desired, the laminate can also include a saturation layer of tissue joined to the blended polyethylene oxide/polyvinyl chloride water-sensitive layer.

Returning now to Figure 1, the anti-splash member 26 includes at least one aperture 36 and at least one seam 38. Figure 1 includes two seams shown as dashed lines since the seams 38 are hidden from view in Figure 1. The aperture 36 forms a restricted opening into the collection portion 24, and the seam 38 divides the container 20

into the receiving portion 22 and the collection portion 24. The aperture may be any size or shape, and may be circular, elliptical, a slit, a hole, or other passageway into the collection portion 24. The aperture 36 may be located anywhere along the seam 38 or multiple apertures and multiple seams may be used. The container 20 further includes a first opposing member 40 and a second opposing member 42 joined together to define a top 44, a bottom 46, and a pair of opposing sides 48. The top 44 has an opening 50 into the receiving portion 22.

Seam 38 may be located anywhere between the top 44 and the bottom 46 of the container 20. The seam 38 can be bifurcated into two seams, which decline towards the aperture 36 as shown in Figure 1, but it is not essential. The seam 38 can be horizontal, inclined, or declined relative to the aperture 36. An alternative embodiment (not shown), is a seam 38 starting at one of the opposing sides 48 and angling downward towards the other opposing side 48 and ending with an aperture 36 located between the seam 38 and the opposing side 48. In yet another embodiment (not shown), the seam 38 can resemble an inverted "V" terminating in a pair of apertures 30 adjacent each of the opposing sides 48 of the container 20.

Seam 38 is formed by joining a portion of the first opposing member 40 to a portion of the second opposing member 42. The seam 38 divides the container 20 into the receiving portion 22 and the collection portion 24, which are in communication with each other through the aperture 36. The seam 38 in combination with the aperture 36 form the anti-splash member 26, and promote the flow of bodily wastes in a direction indicated by arrow 52 while restricting the flow of bodily wastes in a direction opposite to the arrow 52. The opposing members, 40 and 42 respectively, can be joined by a thermal bonding process along the opposing sides 48, the bottom 46, and the seam 38. However, it is not necessary to thermally bond the opposing members, 40 and 42 respectively, and any method of joining as previously defined is possible.

Still referring to Figure 1, the container 20 has a unique shape. The opposing sides 48 are curvilinear, and the top 44 is a larger dimension than the bottom 46. The overall shape of the container 20 is similar to a funnel. The receiving portion 22 has a volume V1, the collection portion 24 has a volume V2, and V1 is greater than V2. It has been determined that in order to readily flush the container 20 down an ordinary water-flushing toilet, the container's shape is an important criteria. The container 20 possesses superior flushability because the bottom 46 and the collection portion 24 pass readily into the toilet bowl's discharge outlet. With the collection portion 24 initially started into the toilet bowl's discharge outlet, the remainder of the container 20 will readily collapse and be pulled along by the toilet's flushing action.

In addition, when the laminate 28 shown in Figure 2 is used to construct the container 20, improved flushability results due to the saturation layer 34. POVH is relatively tacky and can often stick to other surfaces, including the porcelain surface frequently present in the bowl of a water-flushing toilet. Thus, if a two-layer laminate of PLA and PVOH is used to form the container 20, the container 20 can stick to the toilet bowl's porcelain surface especially if the container 20 is not fully submerged when discarded. The stuck portions of the PVOH layer can prevent or reduce flushing of the container 20. Thus, improved flushability for the container 20 can be achieved by selecting a material having a low coefficient of friction or tack for use as the saturation layer 34. For example, ordinary tissue without a wet strength additive has been found useful for the saturation layer 34 to both hydrate the water-sensitive layer 32, and to enhance flushability of the container 20 by preventing sticking during flushing.

Typical water-flushing toilets have a discharge outlet diameter from the bowl of less than about four inches (10.2 cm). Thus, a container 20 designed with a bottom 46 that will fit inside a pipe having an inside diameter of less than about four inches will possess better flushability. However, it has been found that it is not necessary for the bottom 46 to be of a dimension smaller than the discharge outlet. Containers that taper from the top 44 to the bottom 46 have improved flushability such as those shown in Figures 1, 7, and 8. The degree of taper can be expressed as a volume ratio of the receiving portion 24 to the collection portion 22, V2/V1. Therefore, the volume ratio of V2/V1 should be less than about 1 for improved flushability. More preferable the volume ratio V2/V1 should be from about 0.9 to about 0.7. Still more preferable, the volume ratio V2/V1 should be from about 0.6 to about 0.5. Still more preferable, the volume ratio V2/V1 should be from about 0.4 to about 0. The volume ratio V2/V1 for the container 20 of Figure 1 is 0.3, and the volume ratio V2/V1 for the container 20 of Figure 8 is 0.2.

The container 20 also includes an attachment element 54. The attachment element 54 secures the container 20 to the toileting structure or bedpan while in use, yet allows for convenient removal to dispose of the container 20 and bodily wastes. The attachment element 54 may include without limitation; an elastic band; an adhesive strip; adhesive tabs; excess material to place into a groove or holder, or to fold over the edge of the toileting structure; or a drawstring. As shown, the joined portion of the pair of opposing sides 48 terminates at a point 56 located near the top 44. Such a configuration produces a pair of flaps 58. The flaps 58 may be folded over a lip or edge of the toileting structure along phantom line 60, and are especially useful when a bucket or pail serves as a waste receptacle for the toileting structure. The pair of flaps 58 function as an attachment element 54 for the container 20 and may also include handles or openings to grasp.

Referring now to Figures 3, 4, 5, and 6, alternative embodiments for the anti-splash member 26 are illustrated in vertical cross-sections with like reference numbers indicating the same elements in all figures. In Figure 3, the anti-splash member 26 includes a support member 62, and a movable restrictor flap 64 disposed on the support member 62. The support member 62 has a pair of opposing ends joined to the container 20. The restrictor flap 64 is formed into a generally inverted "V" shape and disposed on or joined to the support member 62 defining at least one passageway 66 between the restrictor flap and a sidewall 68 of the container 20. The passageway 66 allows materials within the receiving portion 22 to enter into the collection portion 24. The restrictor flap 64 and support member 62 can be made of any suitable material, and desirably is made of the same material as the container 20.

The passageway 66 may be open at all times by means of a fixed restrictor flap 64, or the passageway 66 may be initially closed and then open by using a movable resilient restrictor flap 64. Thus, the passageway 66 may open when materials within the collection portion 22 contact the restrictor flap 64, and then the passageway 66 may close after passage of the materials into the collection portion 24. The passageway 66 can be a small or large opening, round, oval, or irregular in shape. The passageway 66 can also be an elongated slit or other passageway into the collection portion 24 of the container 20.

The restrictor flap 64 can be flexible, rigid, or resilient. Preferably, the restrictor flap 64 is a resilient material that deforms to permit passage of materials then springs back to its initial position closing the passageway 66. The restrictor flap 64 and support member 50 in combination form the anti-splash member 26, which promotes the passage of material through the passageways 66 in the direction indicated by the arrows 52. At the same time, the flow of material is retarded in a direction opposite to the direction of the arrows 52.

Figure 4 illustrates another embodiment for the anti-splash member 26. In this embodiment, the anti-splash member 26 includes two movable restrictor flaps 64 joined to each other and to the container 20 to define two passageways 66 between the restrictor flaps 66 and the sidewall 68. In the illustrated embodiment, each restrictor flap 64 is formed into an acute angle having a leg portion 80 and a base portion 82. The base portion 82 of one restrictor flap 64 is joined to the base portion 82 of the other restrictor flap 64 forming an assembly that is joined to the container 20. By joining the restrictor flaps 66 together, and then joining the assembly to the container 20, the support member 62 may be eliminated. The pair of restrictor flaps 64 forms a pair of passageways 66, which promotes the passage of material from the receiving portion 22 to the collection

portion 24 in the direction indicated by the arrows 52. At the same time, the flow of material is retarded in a direction opposite to the direction of the arrows 52.

Referring now to Figure 5, another embodiment for the anti-splash member 26 is illustrated. In this embodiment, two or more restrictor flaps 64 are joined to the container 20 to define a single passageway 66, which is spaced away from the sidewall 68. The restrictor flaps 64 desirably are movable and resilient such that the passageway 66 opens and closes, although a fixed passageway 66 is possible and within the scope of the invention. In this embodiment, the passage of materials from the collection portion 22 into the receiving portion 24 is between the restrictor flaps 64, rather then between the restrictor flap 64 and the sidewall 68.

Referring now to Figure 6, another embodiment for the anti-splash member 26 is illustrated. A single restrictor flap 64 is positioned as shown, and joined to the container to define a single passageway 66 between the restrictor flap 64 and the sidewall 68. The restrictor flap 64 desirably is movable and resilient such that the passageway 66 opens and closes, although a fixed passageway 66 is possible and within the scope of the invention.

Referring now to Figure 7, another embodiment of the container 20 and the anti-splash element 26 is shown. The anti-splash member 26 includes a membrane 70 having an outer perimeter 72 and at least one aperture 36, although more can be included as shown. At least a portion of the outer perimeter 72 of membrane 70 is joined to the sidewall 68. Each aperture 36 may be an opening(s), a hole(s), a slit(s), or other passageway(s) into the receiving portion 26 of the container 20.

The membrane 70 may contain many apertures or a single aperture. For instance, in some applications it may be desired to pass all the material collected in the receiving portion 22 into the collection portion 24. This can be accomplished by forming an aperture 36 of an appropriate size in membrane 70. A slit for the aperture 36 has been found to work well by opening to permit passage of materials into the collection portion 24, and then closing to prevent the flow of the materials back into the receiving portion 22. In other applications, such as a commode liner, it may be desirable to separate liquid bodily wastes from solid bodily wastes. This can be accomplished by using multiple apertures 36 in the membrane 70 that permit passage of fluids into the collection portion 24, while retaining solids in the receiving portion 22.

Thus, as previously discussed, several anti-splash means for reducing spilling of materials are possible and within the scope of the claimed invention. The anti-splash means include without limitation, one or more seams defining one or more apertures, one or more restrictor flaps defining one or more passageways, a one-way valve, a check

valve, a membrane with one or more apertures, a necking of the container, or any other means which promotes the flow of material in one direction while restricting or eliminating the flow of material in the opposite direction.

Referring to Figure 8, another embodiment of the container 20 is shown. The container 20 is formed from a first opposing member 40 joined to a second opposing member 42 defining a top 44, a bottom 46, a side wall 68, and a pair of opposing sides 48. The opposing members, 40 and 42, respectively are trapezoidal in shape, and are joined along the pair of opposing sides 48, and along the bottom 46 of the container 20". The top 44 has an opening 50 formed therein, and the overall appearance of the container 20 is similar to a coffee filter. The container 20 also includes an aperture 36 and a seam 38 to form an anti-splash member 26. The collection portion 24 has a volume V1 that is less than the volume V2 of the receiving portion 22. The container 20 is shown disposed within a cross-section of a waste receptacle 74. The waste receptacle 74 can be a circular plastic pail frequently used with a commode.

The container 20 is provided with a pair of handles 76 to assist in removing the container 20 from the waste receptacle 74 after use, and to assist in transporting and disposing of the container 20 after use. The handles 76 are located on the pair of opposing sides 48, and are formed by cutting a slit 78 into the opposing sides 48 perpendicular to the edges thereof. The slit provides an opening for inserting a person's hand or fingers to grasp the container 20 . It is also possible to form the handles 76 in another manner, such as cutting an opening in sidewall 68, or to attach an additional element to the container 20 , which functions as one or more handles 76 for transporting the container.

Referring now to Figure 9, a process to manufacture the container 20 depicted in Figure 8 is illustrated schematically. Two wound rolls 84 of the laminate depicted in Figure 2 are unwound, and then webs W1 and W2 are plied together as they are guided by idler rolls 86 towards a thermal bonder 88. Webs W1 and W2 are unwound such that the barrier layer 30 of web W1 is placed adjacent the barrier layer 30 of Web W2. The thermal bonder 88 join webs W1 and W2 together forming the bottom 46, the pair of opposing sides 48, and the seam 38 of the container 20". The thermal bonder 88 forms a joined two-ply third web W3 that is directed towards a die cutter 90. The die cutter 90 cuts the slits 78 for the container's handles 76, and cuts or scores web W3 forming a plurality of containers. After die cutting, web W3 is separated into a series of individual containers 20 by a separator 92. The individual containers 20 are then folded, stacked, and packaged by a folder 94, a stacker 96, and a packager 98.

Referring now to Figure 10, the web W3 after thermal bonding and die cutting is illustrated. The web W3 is joined together in a repeating pattern by a plurality of thermal bond lines 100, and scored or cut into a repeating nesting pattern by a plurality of die cut lines 102. The individual containers 20 are nested such that a subsequent container 108 is inverted relative to the proceeding container 106. Thus, along an edge 104 of web W3 an unjoined portion of web W3 forming the top 44 of the proceeding container 106 is followed by a joined portion of web W3 forming the bottom 46 of the subsequent container 108. By a "nesting pattern" or "nested containers" it is meant that adjacent thermally bonded container outlines on web W3 can be cut into in individual containers by a single die cut line 102 to sever the opposing side 48 of a proceeding container 106 from the opposing side 48 of a subsequent container 108. It is possible to develop nesting patterns without alternating the orientation of the container.

It is also possible to form multiple containers across the width of web W3 in nesting pattern in addition to the nesting pattern used along the length of web W3. This can be done in one embodiment by thermally bonding and die cutting the nesting pattern shown in Figure 10 twice or more times across the width of a wider web than that illustrated. It is also possible to cut the individual containers with a die cut line 102 that leaves a perforation or otherwise only partially cuts the web W3 between individual containers. This may be desirable for a rolled form of the finished product. For this type of packaging, the seperator 92, the folder 94, and the stacker 96 could be eliminated. The product would then be wound into a conveniently sized roll, for instance a roll of twenty containers, by a winder. The wound roll of containers could then be packaged and dispensed for use similar to bathroom tissue or paper toweling.

Utilizing a container 20 with the bottom 46 of a smaller dimension than the top 44 not only provides improved flushing of the container 20, but also reduces manufacturing waste since a nesting pattern can be used to thermally bond and die cut the individual containers. In addition to reducing waste, the nesting pattern allow for multiple containers to be made in both the machine direction and cross machine direction at the same time improving the productivity of the converting line.

It should be pointed out the container 20 illustrated in Figure 1 can be produced by the process of Figure 9 since the exterior shape of the container will nest with a proceeding container when the subsequent container is inverted similar to the containers 106 and 108 of web W3 illustrated in Figure 10. It should also be pointed out that the dimensions and shape of the top 44, the bottom 46 and the pair of opposing sides 48 can be varied to develop other nesting patterns, and it is not required that the bottom 46 be of a smaller dimension than the top 44 for nesting, although it is preferred for flushability of

the container 20. Such other nesting patterns for the containers are within the scope of the invention.

It will be appreciated that the foregoing background, summary, and detailed description are given for the purposes of illustration, and are not to be construed as limiting the scope of this invention, which is defined by the following claims and all equivalents thereto.